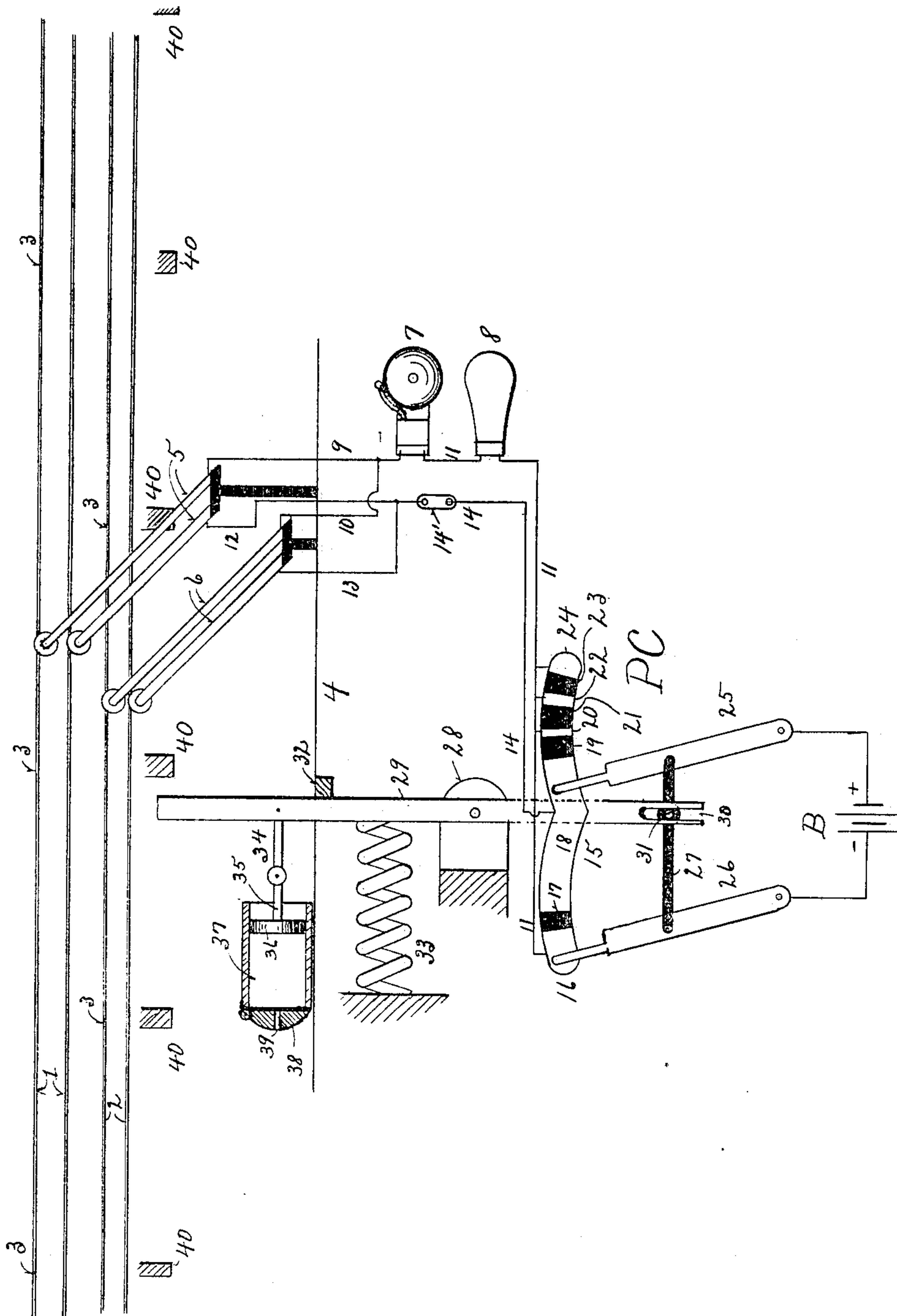


No. 818,855.

PATENTED APR. 24, 1906.

A. L. RUTHVEN.  
RAILWAY SIGNAL SYSTEM.  
APPLICATION FILED SEPT. 1, 1905.



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# UNITED STATES PATENT OFFICE.

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## RAILWAY SIGNAL SYSTEM.

No. 818,855.

Specification of Letters Patent.

Patented April 24, 1906.

Application filed September 1, 1905. Serial No 276,677.

*To all whom it may concern:*

Be it known that I, ALFRED L. RUTHVEN, a citizen of the United States, residing at Topeka, in the county of Shawnee and State of Kansas, have invented a new and useful Improvement in Railway Signal Systems, of which the following is a specification.

The invention relates to danger-signals which may be carried by the trains themselves, preferably on the locomotive, where the engineer will be warned and which are arranged to give the danger-signal whenever two trains are on the same track within a dangerous running distance of each other.

Objects are to improve generally upon such systems and to simplify the mechanisms and equipments employed, to provide a system which has no meeting-point at which approaching trains could collide without due warning, to provide a method whereby the signal will indicate in which direction the other train is running, and to provide the other devices, hereinafter more fully set out.

The invention consists of the parts, improvements, and combinations hereinafter described and claimed.

In the drawing accompanying and forming part of this specification and in the description thereof I have shown the invention diagrammatically in its preferred form and have shown the best mode of applying the principles thereof; but it is to be understood that I do not limit myself to the drawing or to the description of the drawing, that I contemplate changes in form, proportions, materials, size, the transposition of parts, and the substitution of equivalent members without departing from the spirit of the invention.

In the drawing I have shown two series of circuits carried by four wires, although it is evident that these two series of circuits may be carried by any other suitable means, as through the rails, either through one rail or through both, or in any other suitable manner. The first series is shown by the numeral 1 and the second by the numeral 2. Each series is divided into blocks at points of insulation 3 3, respectively, so that we have the two series of overlapping circuits. The part 4 may represent the engine-cab or other place on the moving train where it is desired to place the signaling devices.

5 represents a pair of trolleys or other suitable contacting devices making connection

between the first series of circuits and the apparatus in the cab, and 6 represents the trolleys connecting the second series of circuits with the apparatus in the cab.

B is a suitable battery in the cab, as an ordinary dry battery, and as many cells may be used as may be required.

7 and 8 represent an electric bell and an incandescent electric lamp, respectively, for giving the alarm, and these are located in the cab where the engineer will positively notice their warning. Either one or the other, or both, may be used. Each of the right-hand trolleys leads through wires 9 and 10, respectively, through the wire 11, and through the signaling devices, and each of the left-hand trolleys leads by wires 12 and 13, respectively, through the wire 14. Both wires 11 and 14 lead to opposite poles of battery B through the pole-changer P C, described in detail as follows:

15 is a contact-strip divided into alternate metallic and insulated portions 16, 17, 18, 19, 20, 21, 22, 23, and 24, as shown.

25 and 26 are the contact-springs, connected up with opposite poles, respectively, of the battery B and are connected by an insulated cross-bar 27.

To a bracket 28 is pivoted a lever 29, whose lower end is slotted at 30 to engage a pin 31 in the cross-bar 27 and whose range of motion in one direction is limited by the stop 32 and retained or returned thither by the spring 33. Pivoted to lever 29 is a pitman-rod 34, connected to piston-rod 35 of piston 36, operating in cylinder 37, provided with an air-valve 38, which is perforated at 39. Arranged along the track at suitable intervals are the buffers 40 40, against which the upper or outer end of the lever 29 is adapted to strike.

Normally the parts are in positions shown in the diagram, the right-hand trolleys being connected with the negative side of the battery and the left-hand trolleys with the positive side. Whenever, however, as the train moves along the track, lever 29 encounters a buffer 40, the upper end is thrown rearwardly—i. e., to the left—and the lower end to the right, so as to bring springs 25 and 26 into contact with contacts 24 and 18, respectively, thus reversing the connections of the trolleys with the battery. Upon striking the buffer 40 the lever will move quickly, according to the speed of the train, and this will also



be permitted by reason of the opening of the valve 38; but upon returning to normal position by reason of the tension of the spring 33 the lever will move slowly because of the closing of the valve 38 and the slow inlet of air into the cylinder behind the piston through the small perforation 39, from which it would be clear that, assuming the electric circuit through the pole-changer to be complete, there would be an intermittent ringing or lighting of the signaling devices as the spring 25 passed over contacts 24, 22, and 20, respectively, to normal positions. These buffers 40 I should prefer to locate at each insulating-point along the line and make the blocks a mile or two long each, although this may be arranged to suit any requirement. It is noted that contacts 20, 22, and 24 are all connected with wire 11. It is clear of course that the circuits are all normally open and that they would become closed by any metallic connection between the two wires of any circuit presently engaged by either pair of trolleys.

In equipping the trains with the signals I contemplate that the same poles of the battery shall be connected up with the corresponding trolley or with the corresponding side of the circuits in all trains alike. If, therefore, two trains approach each other and come upon the same block, the signal will be sounded in each train because of the proper connection of the batteries in series, and in such case there would be a ring or light in both engine-cabs, thus warning both engineers that a train is approaching from ahead. If, however, two trains were upon the same block and going in the same direction, the circuit would be neutralized, and thus no signal would be given in either cab; but whenever the rear train should pass a buffer 40, so that the pole-changer became shifted, as heretofore explained, and the train thereupon would come into the circuit with the train ahead then on account of the proper connection of the batteries in series the signal would be given in both cabs; but this signal, instead of being continuous would be intermittent, as the circuit was made and broken by spring 25 in passing back slowly over the contact-strip. In this manner the trainmen would know that the signal was caused by two trains going in the same direction. The rear engineer would know the other train was ahead because he himself had just passed a buffer, and the engineer in the train ahead would know that ordinarily that the other train was back of him because of the reason that he had not just passed a buffer. I am assuming, too, that when a train is backing its battery should be connected up oppositely to its normal connection. By overlapping the circuits it is impossible for two trains to meet at a junction-point between two adjacent cir-

cuits without the danger-signal. As it is clear that the closing of the circuit will give the danger-signal, it is also clear that an open switch may be made to give the signal by causing it to automatically close the circuit when opened, and the same of a railway-crossing or other place. This contact or connection may be made automatically, or it may be made by hand to stop a train. A switch 14' may be provided for cutting out the signaling devices whenever desired, as when trains are on the same block, but under control.

What I claim is—

1. In a railway danger-signal system, a series of overlapping circuits arranged along the track, suitable connecting means with the train, a signaling device on the train, a battery, a pole-changer with several contacts, and an operating device therefor whereby in normal position a continuous signal is given, and in shifted position an intermittent signal is given.

2. In a railway danger-signal system, a series of circuits arranged along the track, suitable connecting means with the train, a signaling device on the train, a battery, a pole-changer adapted in one position to a continuous signal and in shifted position to an intermittent signal, and means for shifting the pole-changer at intervals.

3. In a railway danger-signal system, a series of overlapping circuits, trolleys connecting same with the train, signaling devices on the train, a battery on the train, a pole-changer adapted to be returned slowly to normal position and to close circuit intermittently during such return, and means for shifting the pole-changer at intervals along the track.

4. In a railway danger-signal system, a series of overlapping circuits, trolleys connecting same with a moving train, signaling devices on the train, a pole-changer on the train, a battery, said pole-changer being adapted to return to normal position slowly and to close circuit intermittently during such return, an operating-lever for the pole-changer, and buffers along the track for operating the pole-changer at intervals.

5. In a railway-danger-signal system, a series of overlapping circuits, trolleys connecting same with a moving train, signaling devices on the train, a battery, a pole-changer adapted in one position to afford continuous passage and in shifting position to afford intermittent passage for the current, an operating-lever therefor, and devices along the track for operating said lever.

In testimony whereof I have hereunto set my hand in the presence of witnesses.

ALFRED L. RUTHVEN.

Witnesses:

Z. T. FISHER,

JOHN A. HULIT.